

Lemierre Syndrome: A Case Report of a 23-Year-Old Female with Respiratory Distress and Septic Thrombophlebitis

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Abstract

Lemierre syndrome is a rare, severe condition that develops as a sequela of oropharyngeal infections and can lead to septic thrombophlebitis with potential for systemic dissemination and multi-organ involvement. This report examines a 23-year-old female presenting with respiratory distress, ultimately diagnosed with Lemierre syndrome secondary to *Fusobacterium necrophorum* infection. Her clinical course included septicemia, respiratory failure, and an internal jugular vein thrombosis, a hallmark feature of Lemierre syndrome. The patient also developed an unusual complication of subclavian Deep Vein Thrombosis (DVT), underscoring the potential complexity of this syndrome. This case highlights the importance of prompt recognition and management, particularly in young, otherwise healthy individuals with recent oropharyngeal infections. Treatment included broad-spectrum intravenous antibiotics, anticoagulation therapy, and supportive care, ultimately resulting in a favorable outcome. This report underscores the need for clinician awareness of Lemierre syndrome's rapid progression, potential complications, and the critical importance of early diagnosis and intervention.

Introduction

Lemierre syndrome, first described by André Lemierre in 1936, is also known as the "forgotten disease" due to its rarity and often-overlooked symptoms. This syndrome is a critical infectious condition that primarily affects young, otherwise healthy individuals. Lemierre syndrome typically develops following an acute oropharyngeal infection, leading to septic thrombophlebitis, most commonly of the internal jugular vein. Without prompt intervention, the infection can spread, leading to systemic septic emboli and multi-organ complications, such as septic shock, Acute Respiratory Distress Syndrome (ARDS), and Deep Vein Thrombosis (DVT).

The primary causative pathogen in Lemierre syndrome is *Fusobacterium necrophorum*, an anaerobic Gram-negative bacterium that resides in oropharyngeal flora. This bacterium possesses several virulent factors, such as lipopolysaccharides, hemagglutinins, and leukotoxins, that enable it to invade host tissues, evade immune defenses, and hematogenous spread. Although Lemierre syndrome typically begins with symptoms resembling common respiratory infections, its rapid progression and nonspecific presentation can lead to delays in diagnosis, complicating the patient's outcome.

This report details the case of a 23-year-old female initially diagnosed with tonsillitis by her general practitioner (GP) but ultimately diagnosed with Lemierre syndrome after presenting

to the emergency department with severe respiratory distress. This report emphasizes the key aspects of diagnosis, management, and an unusual complication of subclavian DVT.

Case Presentation

Patient History

A 23-year-old previously healthy female presented to the emergency department (ED) with acute respiratory distress and hypoxemia. Her symptoms began approximately seven days prior with a sore throat and low-grade fever, which her GP initially diagnosed and managed as tonsillitis. Treatment included amoxicillin, analgesics, and hydration. Despite this, her symptoms continued to worsen, progressing to severe tonsillitis with odynophagia (painful swallowing), fever, and dysphagia (difficulty swallowing). She experienced increasing respiratory distress and oxygen desaturation over the next few days, which ultimately led her to seek emergency care.

Initial Presentation

Upon arrival at the ED, the patient's clinical presentation was consistent with systemic infection and respiratory compromise. Her vital signs showed tachycardia (120 beats per minute), tachypnea (28 breaths per minute), and hypoxemia with an oxygen saturation of 82% on room air. She also presented with a fever of 38.5°C and hypotension (90/60 mmHg). Given the severity of her respiratory distress and suspected sepsis of unknown origin, she was admitted to the resuscitation area,

where supplemental oxygen was initiated, and broad-spectrum intravenous antibiotics were promptly administered.

Laboratory Findings

Initial laboratory findings revealed significant abnormalities, including:

- **C-reactive protein (CRP):** Elevated >300 mg/L, consistent with a severe inflammatory response.
- **Hemoglobin:** 9 g/dL, suggestive of acute anemia.
- **Platelet count:** $18 \times 10^9/L$, indicating thrombocytopenia.
- White blood cell count (WBC): $18,000/\mu L$ with a left shift, supporting a bacterial infection.

The patient received a blood transfusion to address her anemia and a platelet transfusion to correct her thrombocytopenia. Initial antibiotic coverage included piperacillin-tazobactam and vancomycin, which were chosen to cover both Gram-positive and Gram-negative bacteria, including potential anaerobes like *Fusobacterium necrophorum*.

Imaging and Diagnostics

A computed tomography (CT) scan of the chest revealed extensive bilateral pulmonary consolidations and multiple small pulmonary emboli, suggestive of septic emboli. Given her clinical presentation, throat cultures and blood samples were obtained for microbiological analysis, and therapeutic anticoagulation was started to treat the pulmonary emboli. As her respiratory distress worsened, she was transferred to the Intensive Treatment Unit (ITU), where throat swab cultures confirmed the presence of *Fusobacterium necrophorum*, establishing a definitive diagnosis of Lemierre syndrome.

Case Analysis

Clinical Course in the Intensive Treatment Unit

Once in the ITU, the patient's condition quickly deteriorated, with complications including acute respiratory distress syndrome (ARDS) and septic shock. She was managed with high-flow oxygen and aggressive fluid resuscitation, while inotropic support stabilized her blood pressure. Her antibiotic therapy was adjusted to include metronidazole, specifically targeting anaerobic pathogens such as *Fusobacterium necrophorum*, which was confirmed through throat culture.

A chest drain was inserted to address her pulmonary emboli, leading to an improvement in her respiratory distress. After this intervention, her oxygen requirements began to decrease significantly.

During her ITU stay, the patient developed a subclavian DVT, likely secondary to a hypercoagulable state induced by sepsis, prolonged immobility, and increased central venous pressures. Prompt recognition of this complication allowed for a swift adjustment in her anticoagulation regimen to address this additional thrombotic risk.

Complications and Recovery

The subclavian DVT was initially managed with low-molecular-weight heparin (LMWH), with plans to transition to oral anticoagulation as her clinical status improved. After 10 days in the ITU, the patient's respiratory and hemodynamic status had stabilized, allowing for her transfer to a general respiratory ward. Her six-week antibiotic regimen included oral metronidazole following hospital discharge.

Laboratory Results at ITU Transfer

Upon stepping down from the ITU, her blood picture was as follows:

- **CRP:** 50 mg/L, indicating resolving inflammation.
- **Hemoglobin:** 85 g/dL, indicating mild anemia.
- **Platelet count:** $777 \times 10^9/L$, reflecting a hypercoagulable state.
- **WBC count:** $11.9 \times 10^9/L$, suggestive of a resolving bacterial infection.

On her final day in the hospital (day 15), the patient's bloodwork showed further improvements:

- **CRP:** 9 mg/L, consistent with resolution of inflammation.
- **Hemoglobin:** 101 g/dL, indicative of resolving anemia.
- **Platelet count:** $596 \times 10^9/L$, suggesting a gradual resolution of her hypercoagulable state.
- **WBC count:** $9.7 \times 10^9/L$, within normal limits.

Discharge and Follow-Up

Upon discharge, the patient was prescribed a three-month course of oral rivaroxaban to manage the DVT, with follow-up appointments scheduled with ENT and hematology to monitor for any long-term sequelae or complications.

Discussion

Pathophysiology and Clinical Features of Lemierre Syndrome
Lemierre syndrome occurs when *F. necrophorum* spreads from the oropharynx into adjacent tissues, subsequently invading the internal jugular vein and causing septic thrombophlebitis. The pathogen's virulence factors—lipopolysaccharides, hemagglutinins, and leukotoxins—facilitate its evasion from immune responses and allow it to propagate systemically. Hematogenous spread of the infection can cause septic emboli, most frequently affecting the lungs and leading to respiratory complications like ARDS, as seen in this case.

Complications and Management of Subclavian DVT

The development of subclavian DVT is a rare but serious complication. In this case, contributory factors likely included a hypercoagulable state secondary to sepsis, prolonged immobility, and increased central venous pressure. Immediate recognition of this DVT allowed for modification in anticoagulation therapy, reducing the risk of further complications, such as additional embolic events.

Importance of a Multidisciplinary Approach

The management of Lemierre syndrome is best achieved through a multidisciplinary approach. Early and aggressive antibiotic therapy, guided by microbial culture results, is essential to eradicate the infection. Supportive care for respiratory distress, particularly in cases of ARDS, is equally critical, and close monitoring for thrombotic complications is warranted. Collaboration across infectious disease, hematology, and critical care specialties enabled comprehensive management of this case.

Key Learning Points

1. Recognition of Atypical Presentations: Lemierre syndrome should be considered in young patients presenting with respiratory distress and signs of systemic infection following recent oropharyngeal infections.
2. Importance of Early Intervention: Prompt initiation of broad-spectrum antibiotics and supportive care can signifi-

cantly improve outcomes.

3. **Monitoring for Complications:** Clinicians must be vigilant for vascular complications, including DVT and septic emboli.
4. **Multidisciplinary Approach:** Coordinated care across specialties improves outcomes and is crucial for managing complex cases effectively.

Conclusion

This case highlights the severe implications of Lemierre syndrome following tonsillitis and underscores the significance of subclavian DVT as a complication. Early diagnosis and intervention are essential for improving outcomes, especially in young, healthy patients with post-oro-pharyngeal infection symptoms. Increasing clinician awareness of Lemierre syndrome, its diagnostic challenges, and complications may prevent delays in care and reduce morbidity associated with this rare but dangerous condition.

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